



# Utah OSHA Compliance Assistance Newsletter

## Winter 2005



### National News

#### OSHA Offers General Industry Sector Quick Start Guide

OSHA has created a step-by-step online guide to introduce employers and workers in general industry to the agency's compliance assistance resources. [Quick Start](#) helps you identify many of the major OSHA requirements and guidance materials that may apply to your individual workplace. While not comprehensive, the guide does provide the reader with a basic foundation for information and guidance on workplace safety and health regulations and assistance tools that can be tailored to individual worksites.

#### Electric jolt fatal to worker on Long Island.

Two men working on a Long Island home were hit by 7,600 volts of electricity yesterday when their scaffold touched a live wire, killing one and critically injuring the other, cops said. The contractors were familiar with the power lines as they had installed a second-story addition. Scaffolding should be erected at least 10 feet away from high power lines according to OSHA regulations. Despite knowing about the power lines the scaffolding was erected close to the power lines resulting in electrocution of the employee. Read the original article at:

<http://www.nydailynews.com/front/story/252919p-216540c.html>



### UOSH News:

On October 18, 2004, an employee of an HVAC contractor accessed a residential construction rooftop in order to install vent caps for a heating system. This task usually takes about five minutes to accomplish due to most of the work being done from inside the house. The employee was wearing a rock climbing type harness, which he apparently intended to secure to a rope he had attached to the front of the house and thrown over the roof. Although there were no eyewitnesses, the victim appeared to have fallen from the roof before he was able to secure the rope to his harness. The level to which the victim fell was approximately 29 feet below the roof's eave. Injuries sustained from the fall resulted in the victim's death.

So many times we hear the excuse of "It will only take a minute", or "It would take longer to find the equipment than it would to do the job." This is a perfect illustration of the fact that it only takes a second to lose your life. Safety is a decision and a focus which needs to be maintained continuously throughout the day. The fact that rock climbing gear is insufficient for use as fall protection may very well be relevant to this incident. The victim fell before he was able to secure his rope. Modern fall protection is designed so that connections can be made quickly and maintained without major distraction when working in areas where concentration is required elsewhere.

### Utah OSHA Consultation Program

#### Safety & Health Achievement Recognition Program (SHARP)

Safety & Health Achievement Recognition Program (SHARP) was introduced to Utah Employers two years ago. Since that time several Utah companies have actively sought to join the three current participants in the program. Two exemplary companies have renewed their SHARP status for a second year and have also gone on to be recognized by their peers and other nationally recognized organizations. Four new companies are currently participating in the probationary period and they will complete the program within 12 months.

Utah OSHA is currently considering a 1 or 2 years SHARP status. SHARP eligibility is extended to companies with 250 employees at one location or 500 corporate wide. If you would like additional information on how participate contact our office at 801-530-6855 or 801-530-6857. Or you can write to:

State of Utah OSHA Consultation Program  
160 East 300 South, Third Floor  
P.O. Box 146650  
Salt Lake City, UT 84114-6650

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### Recently asked questions:

- ✓ What constitutes a serious accidents?

Employers are required to investigate all worker injuries or occupational diseases, and within 8 hours of occurrence notify UOSH by telephone at 530-6901, of all fatalities and disabling and serious injuries and illnesses to workers.

Guidance on "disabling and serious" includes, but is not limited to the following: permanent or temporary impairment in which part of the body is made functionally useless or is substantially reduced in efficiency on or off the job which would usually require treatment by a medical doctor (examples of such injuries are any amputation, fracture, deep cuts, severe burns, electric shock, sight impairment and concussions); illnesses that could shorten life or significantly reduce physical or mental efficiency by inhibiting the normal function of a part of the body (examples of such illnesses include cancer, silicosis, asbestosis, byssinosis, hearing impairment and visual impairment).

- ✓ Are the interim fall protection guidelines valid for residential fall protection?

No, interim fall protection guidelines will no longer be valid starting from January 1, 2005. Employers must follow the 29 CFR 1926.501, 502 and 503 to comply with the fall protection requirements. They must develop a Fall Protection Plan [1926.503(k)] if they cannot provide conventional fall protection only if they are performing residential construction work, leading edge work and precast concrete erection work.

Contact UOSH at (801)530-6901 for a copy of the UOSH construction CD with more guidelines on fall protection requirements.

## Fall Protection System

Inappropriate Attachment of Snaphook to Line



Two Carabiners on Anchor, equipment on carabiner, and non-self-locking carabiners



Anchor Strap and Carabiners



Twin Lanyard w/ Leg Hooks or aka Pelican Hooks



Roof Bracket- Anchor



Rope Grab



Roof Anchor System



ClawRoof Anchor



## News Briefing

### Welding Picture

While the photo highlights the poor safety practices in a developing country, how does your workplace in a so-called developed country actually measure up? Have you checked on your welders lately? Do they have and use?



- \* Approved welding visors maintained in good condition
- \* Appropriate safety footwear
- \* Welding gloves
- \* Clear and uncluttered work areas (housekeeping)
- \* Flame retardant clothing
- \* Fire protection (appropriate fire extinguishers available and current)
- \* Job Safety Analysis (JSA's) or work method statements for their tasks
- \* Fume extraction
- \* Respiratory protection
- \* Ergonomic workbenches

[http://www.safetysmart.com/ezone/112904/pic\\_this.html](http://www.safetysmart.com/ezone/112904/pic_this.html)

#### OSHA Cites Two Contractors for Cave-In Hazards at Concord Jobsite

Failure to provide cave-in protection for workers at a Concord jobsite has resulted in two Granite State contractors being fined a total of \$39,150 by the U.S. Labor Department's Occupational Safety and Health Administration (OSHA). Employees were working in an unprotected ten-foot deep excavation.

Both contractors were cited for allowing employees to work in an excavation that lacked protection against a collapse of its walls and for not providing a ladder or other safe means for workers to enter and exit the excavation. Cave-in protection is necessary since the walls of a trench can collapse suddenly and with great force, stunning and burying workers beneath tons of soil and debris before they have a chance to react or escape.

Employers are responsible for providing a safe and healthful workplace for their employees. OSHA's role is to assure the safety and health of America's workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health. For more information, visit: [www.osha.gov](http://www.osha.gov).

### HOW MUCH DOES SOIL WEIGH?

DEPENDENT ON THE DENSITY AND WATER CONTENT:

- ☑ One cubic yard weighs - 3000lbs or more
- ☑ One cubic foot weighs - 100lbs or more

3 FEET

3000lbs or more

1 FOOT

100lbs or more

### MECHANISM OF DEATH

- ☑ Asphyxiation
- ☑ Each time a breath is exhaled the weight of the load restricts inhalation of the next breath. Blow out is usually followed unless rescue is immediate.

1

Type B soil weighs approx. 100 lbs/cu. ft.

Lateral (horizontal) pressure is approx. half of downward (vertical) earth pressure

500lbs. of lateral pressure at the base of this 10 ft. deep cubic foot column

10'

1000lbs. of natural downward earth pressure

Hattarcole

Just like a cut on our arm - a cut made in the earth's surface will eventually "heal". All trenches and excavations will eventually cave-in. We just don't know when.

How long trench walls stand depend primarily on soil type and weight, moisture, and organic material.

There are already naturally occurring forces attempting to cave-in the trench.



### Occupational Fatalities in Utah (June - November, 2004)

There have been occupational fatalities between June through October, 2004. A brief summary is given below:

Month	Accident Type	Accident Summary	Recommendations
June	Truck roll over	Tire blew up on a 10-wheel dump truck	UDOT jurisdiction
July	Truck roll over	Brakes on waste truck overheated	UDOT jurisdiction and local law enforcement agency
	Heart Attack	Employee collapsed due to heart attack	Call UOSH within 8-hours
August	Heart attack		Call UOSH within 8-hours
	Employee run over by vehicle	Employee exiting manhole was run over by a vehicle	<p>1. Barricade the work area to prevent vehicles or unauthorized personnel from entering the work zone.</p> <p>2. <b>29 CFR 1910.146(d)(1)</b> for confined space entry requires: Implement the measures necessary to prevent unauthorized entry;</p>
	Electrocution	Employee operating a concrete pumper truck was electrocuted when the boom contacted overhead power lines	<p>1. Maintain at least 10 feet distance when working near overhead electrical lines.</p> <p>2. Approach distance of equipment to overhead power lines shall be a minimum of 10 feet at 50 kv or less and a minimum of 10 ft plus 0.4 inch for each 1 kv added over 50 k, unless deenergized or insulated. 29 CFR 1926.600(a)(6) and 1926.550(a)(15)</p>
September	Truck roll over		UDOT jurisdiction
October	Fall from roof	Employee installing roof vent cap without appropriate fall protection fell 29 feet and received fatal injuries	<p>1. Use full body harness for fall protection when working on steep roof (&gt; 4 in 12 slope) at heights greater than 6 feet from the ground.</p> <p>2. 29 CFR 1926.503(a)(1) requires: The employer shall provide a training program for each employee who might be exposed to fall hazards. The program shall enable each employee to recognize the hazards of falling and shall train each employee in the procedures to be followed in order to minimize these hazards.</p>
	Heart attack		Call UOSH within 8- hours

## Lessons Learned

### Recent accidents in Utah (2004)

Month	Accident type	Accident Summary	Recommendation
October	Fall from roof	Employee (general industry) entered roof through roof hatch and stepped out without any fall protection. The employee fell down 15 feet to the ground. He received 5 broken bones and a broken collar bone.	According to the Utah Administrative Code R614-1-6, Personal Protective Equipment:  “ ...life lines and safety harnesses shall be provided for and used by workers engaged in window washing, in securing or shifting thrustouts, inspecting or working on overhead machines supporting scaffolds or other high rigging, and on steeply pitched roofs. Similarly, they shall be provided for and used by all exposed to the hazard of falling, and by workers on poles, workers or steel frame construction more than ten (10) feet above solid ground or above a temporary or permanent floor or platform.
	Crushed hand	Employee #1 placed hand along the die to inspect it while the machine was on. At the same time employee #2 reset the machine causing the die to crimp and crush employee#1 's hand. Supervisor did not enforce the use of safe operating procedures.	29 CFR 1910.147(c)(1) requires: Energy control program. The employer shall establish a program consisting of energy control procedures, employee training and periodic inspections to ensure that before any employee performs any servicing or maintenance on a machine or equipment where the unexpected energizing, startup or release of stored energy could occur and cause injury, the machine or equipment shall be isolated from the energy source and rendered inoperative.
	Eye Injury	An employee shot a pneumatic nail gun into a thin wall. A piece of metal from the nail hit his nose and went into his eye. He was not wearing safety glasses at the time of the accident.	1. Perform hazard assessment of each type of job and provide appropriate personal protective equipment.
September	Truck ran over employee	An employee was performing maintenance work under the front axle of a ten-wheeler. The supervisor, due to a miscommunication, turned on the truck and ran over the chest of the employee. The employee received serious injuries including cracked ribs and partially collapsed lungs.	Follow lockout/tagout procedures according to 29 CFR 1910.147(c)(1)
	Wall fell on employee at a construction site	Employee was injured by a wall he was raising with coworkers when the workers lost control of the wall and it fell.	Implement a policy or procedure in order to determine a “cutoff” point where the size or weight of a specific wall would exceed the estimated lifting capacity of the available crew. The use of “wall jacks”, or other mechanical devices designed to lift walls into place would also be an acceptable method

	Electrocution	An employee was working on a 480 v panel without de-energizing it first. The employee was not using electrically insulated tools on the energized panel. An arc blast occurred due to a failure of the circuit breaker in the panel, insulated tools were not used.	<ol style="list-style-type: none"> <li>1. Establish Energy Control procedures while working on energized equipment.[1910.147(c)(4)(i)]</li> <li>2. Provide fire resistant clothing to prevent being burned from arc blasts[1910.132(d)]during maintenance and trouble shooting</li> <li>3. Provide face shield to prevent injuries to eyes and face from arc blast[1910.335(a)(1)(v)]</li> <li>4. Provide electricians with insulating tools to prevent electric shock or electrocution.[1910.335(a)(2)(i)</li> </ol>
	Finger amputation	<u>Employee working on a table saw with a dado blade without adequate guarding. The workpiece rolled and exposed the blade. As a result two fingers were amputated.</u>	<ol style="list-style-type: none"> <li>1. <u>Use push sticks for this type of work where the workpiece is too small to serve as a guard for the blade saw.</u></li> <li>2. <u>Careful evaluation of the process to plan cuts so that full stock is cut first, followed by cross cuts where shorter pieces are required.</u></li> </ol>
<u>August</u>	<u>Toxic chemical ingestion</u>	Employee ingested toxic chemical from a bottle that was identical to a drinking bottle. The chemical bottle was not labeled to identify its contents.	<ol style="list-style-type: none"> <li>1. <u>Train employees to label chemical bottles to identify its contents according to the labeling requirements of the hazard communication program 29 CFR 1910.1200(f)(1).</u></li> <li>2. <u>Do not use containers normally identified with food or beverage to store chemicals</u></li> </ol>

# Occupational Asthma and Its Cost for Employers

## What is Occupational Asthma?

An estimated 11 million workers from a range of industries and occupations are exposed to at least one of the numerous agents known to be associated with occupational asthma. Occupational factors are associated with up to 15% of disabling asthma cases in the United States. Asthma is an illness characterized by intermittent breathing difficulty including chest tightness, wheezing, cough and shortness of breath. It is frequently serious and sometimes fatal.

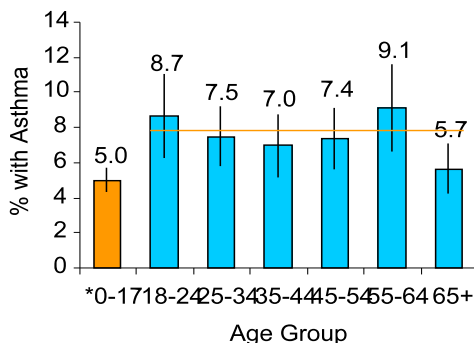
## Cost for Employers

Occupational asthma is now the most prevalent occupational lung disease in developed countries, and has large financial implications for employers if preventative measures are not taken. It's estimated that 1.6 billion dollars is associated with asthma-related medical costs, (74% direct and 26% indirect). "These estimates are conservative since we ignored costs associated with pain and suffering as well as the value of care rendered by family members." Employers also face costs due to missed workdays, decreased productivity, workers compensation claims, and accommodating employees with job reassignments.

## What is happening in Utah?

- Approximately 7.2% of Utahns, or an estimated 168,390 individuals, are under medical care for asthma.
- Literature shows that approximately 15% of adults with asthma can attribute their asthma to their occupation or industry, or about 7,680 Utah adults.
- Preliminary data gathered in Utah and literature reviews show mining, construction, manufacturing, transportation, and service industries as "high-risk" settings for occupational asthma.

Prevalence of Asthma in Utah By Age Group, 2001-2002



## What more information about occupational asthma?

Contact Libbey Mathews, Utah Asthma Program, at [lmathews@utah.gov](mailto:lmathews@utah.gov) or 801-538-6441 or visit [www.osha.gov/SLTC/occupationalasthma](http://www.osha.gov/SLTC/occupationalasthma).

1. Safety and Health Topics: Occupational Asthma [Internet]. U.S. Department of Labor [Cited 2004 10 Dec]. Available from <http://www.osha.gov/SLTC/occupationalasthma>
2. J. Paul Leigh, PhD; Patrick S. Romano, MD, MPH; et al., *Costs of Occupational COPD and Asthma*. American College of Chest Physicians. 2002;121:264-272.
3. 2001-02 Behavioral Risk Factor Surveillance System, BRFSS, Health Status Survey

## Window Cleaning Guidelines

! Safety Program: Employers should design, develop, and implement a comprehensive safety program. This would include a written safety manual and periodic documented review of the safety precautions in the manual with employees.

! The employer must provide safe equipment and training to the employees for window washing.

- ▶ The employer should evaluate the tasks performed by workers; identify all potential hazards; and then design, develop, implement, and enforce a comprehensive safety program addressing these issues.
- ▶ Prior to starting any job, the employer should conduct a jobsite survey, identify all hazards, and implement appropriate control measures.
- ▶ It shall be the responsibility of the employer to provide such safety devices and equipment as required by this rule. He shall be responsible for the proper use and maintenance of such equipment and devices.
- ▶ It shall be the responsibility of the employee to wear and employ the devices so provided as directed and to assist in its reasonable care and maintenance.
- ▶ Only employees who have been adequately trained and instructed shall be permitted to clean windows where the use of anchors, safety harnesses, swinging scaffolds, boatswains' chairs, tackle or other similar equipment is required.

Building owners who have routine maintenance performed on their buildings should consider the installation of permanent anchor points. Any anchor points identified or installed should be able to withstand a minimum load of 5,000 lbs.



Window washer does not have proper safety harness on, using rock climbing gear.

### ! Fall Protection

- ▶ Anyone working on, or from a roof with a fall exposure should be tied off with a safety line. The safety line should be attached to a specifically engineered independent anchorage point.
- ▶ The window washer's "portable support device" (carriage) should be set up with appropriate counterweights and tie-

backs. The tie-backs need to be attached to approved, specifically engineered anchorage points.

- ▶ Anchorage points for the employee safety line and the carriage should be independent of each other.

- ▶ All persons who work at heights, should be trained, educated, and knowledgeable in all aspects of the safe use of their tools and equipment and be made aware of all the hazards related to their job.
- ▶ Work safety and fall protection plans should be developed and implemented at all work sites.
- ▶ Employers need to effectively supervise and coach employees who have little or no experience in performing high-risk jobs, such as working at heights in the window washing industry.
- ▶ Employers should have a clear understanding of and abide by child labor laws that prohibit persons less than 18 years old from working in occupations that are declared to be hazardous.
- ▶ Building owners and contractors should conduct pre-job inspections to review job requirements and safe work plans.
- ▶ Safer methods to conduct high-risk jobs should be sought.



If employee loses his grip, the rock climbing harness will not protect him from falling. His legs will come out of the harness and he will free fall to the ground below.

! Window - Utah Administrative Code requires the following:



- Windows which are of such type that both the inside and the outside of the window may be cleaned from the inside, if over 10 feet to the top of the window on the outside must be cleaned from the inside of the building.
- Windows whose top is over 36 feet above ground, floor or flat roof, and which are of the type that cannot be cleaned from the inside must be provided with window anchors, or shall be cleaned only by use of swinging or built-up scaffolds or boatswains' chairs or other satisfactory method providing equal safety.
- When window anchors are used, they shall meet the requirements of ANSI Standard A39.1-1969 and shall be inspected and maintained in a safe manner. No window cleaner shall use an anchor which he finds to be loose or insecure.
- When working from a suspended scaffold or boatswain's chair, the employee shall wear an approved safety harness and shall be tied off to a line supported from a separate roof anchorage to the ground which must be separate from the rest of the rigging. The fall line shall be provided with an approved automatic locking device.

### Examples of inappropriate anchorage points



Typical wall-mounted U-bar safety anchor.



Typical roof anchor

Lifelines should never be tied back to rooftop items other than a properly designed and engineered safety anchor. Clearly, objects such as vent pipes, air conditioning units, service piping, and metal ladders as shown above are not suitable for supporting a worker in the event of a fall.

### Equipment Setup:

- When designing equipment which requires correct user set-up for safe operation, manufacturers should use equipment design features which reduce the likelihood of incorrect assembly.
- When prevention of incorrect assembly by design cannot be achieved, manufacturers should install electrical interlocks to prevent operation of incorrectly assembled equipment.
- Employers must require employees using any type of aerial lift to tie-off to a boom or basket.

- Ensure that when employees use descent control devices a separate fall arrest system (including a full body harness with a rope grab or similar device, lifeline, and anchorage) completely independent of the device and its support system, is also used
- Ensure that a competent person evaluates and inspects all anchor points to be used by window washers prior to the start of work
- Ensure that all employees, including part- time employees, are properly trained in all facets of the jobs they are to perform
- Ensure that descent control devices are used in accordance with manufacturers' specifications and that employees are trained in the proper use of such equipment
- In the context of window cleaning, ANSI I- 14.1- 2001, section 9.1.3, permits the simultaneous use of an anchorage as an equipment tie- back and lifeline anchorage if it is "capable of supporting the anchorage load factor multiplied by the combo of the fall arrest load and the tie- back load."

Equipment: Utah Administrative Code requires the following:

- Extension tools shall not be over 6 feet long. A cleaner using a brush or squeegee on a pole shall attach it to his person by a wristloop, or other device to prevent dropping. Each extension device so used shall have a locking device to prevent inadvertent detachment of the brush or squeegee.
- Brushes, buckets, squeegees, and other equipment used by a cleaner working on a scaffold or boatswains' chair shall be fastened to equipment at the moment when not in actual use in the hand of the cleaner.
- When cleaning windows, special care shall be used where electrical supply lines present a hazard.
- Window jacks and all other platform devices fastened to window sills for a cleaner to stand upon outside of the window without standard harnesses and anchors are prohibited.
- Ropes used in windows, cleaning operations shall be inspected before being used and shall be discarded if unsafe.

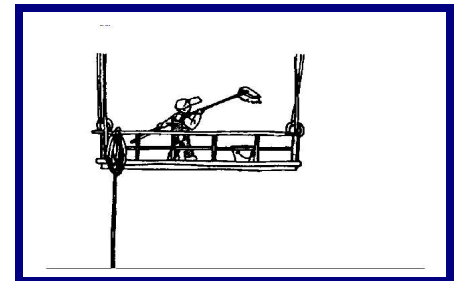
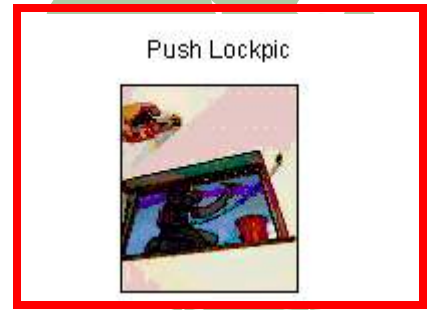
Powered Platforms, Manlifts, and Vehicle- Mounted Work Platforms (1910.66)

- Building owners of new installations (after 1990) shall inform the employer before each use in writing that the installation meets the requirements of paragraphs (e)(1) and (f)(1) of this section and the additional design criteria contained in other provisions of paragraphs (e) and (f) of this section relating to: required load sustaining capabilities of platforms, building components, hoisting and supporting equipment; stability factors for carriages, platforms and supporting equipment; maximum horizontal force for movement of carriages and davits; design of carriages, hoisting machines, wire rope and stabilization systems; and design criteria for electrical wiring and equipment.
- Building support structures covered, by paragraph 1910.66(e) must undergo periodic inspection by a competent person at intervals not exceeding 12 months. Under paragraph 1910.66(d) Definitions, competent person means a person because of training and experience, is capable of identifying hazardous or dangerous conditions in powered platform installations and of training employees to identify such conditions.

Building installation requirements:

- General requirements. The following requirements apply to affected parts of buildings which utilize working platforms for building maintenance.

- ▶ Structural supports, tie-downs, tie-in guides, anchoring devices and any affected parts of the building included in the installation shall be designed by or under the direction of a registered professional engineer experienced in such design;
- ▶ Exterior installations shall be capable of withstanding prevailing climatic conditions;
- ▶ The building installation shall provide safe access to, and egress from, the equipment and sufficient space to conduct necessary maintenance of the equipment;
- ▶ The affected parts of the building shall have the capability of sustaining all the loads imposed by the equipment; and,
- ▶ The affected parts of the building shall be designed so as to allow the equipment to be used without exposing employees to a hazardous condition.



#### Scaffolds

- ▶ Employers must comply with 29 CFR 1910.28 for the specific type of scaffolding used during window washing.
- ▶ Employers should conduct initial and periodic inspections of erected scaffolding.
- ▶ After the erection of scaffolding at any project site the employer should designate a competent person to initially inspect the scaffolding and again, at designated intervals, re-inspect the scaffolding.
- ▶ Counterweights used with outriggers, should be sufficient to balance four times the intended load and securely fastened to the outrigger beam.
- ▶ When counterweights are used with outriggers supporting a suspension scaffold, counterweights should be sufficient to balance four times the intended load. Counterweights should be securely fastened to the outriggers with the steel bar pushed through the hole in the counterweights as well as through the hole in the outrigger.
- ▶ Inspection should include, but not be limited to the following:
  - 1) Braces
  - 2) Brackets
  - 3) Footing (anchorage)
  - 4) Guardrails and Toeboards
  - 5) Ladders
  - 6) Legs
  - 7) Locking Pins
  - 8) Overhead Protection
  - 9) Planking
  - 10) Poles
  - 11) Securing
  - 12) Slippery Conditions
  - 13) Trusses

#### 14) Uprights.

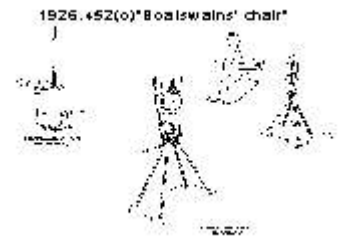
"Boatswain's chairs."

1910.28(j) specifies requirements for boatswains's chairs used during window washing as follows:

- (j)(1) The chair seat shall be not less than 12 by 24 inches, and of 1-inch thickness. The seat shall be reinforced on the underside to prevent the board from splitting.
- (j)(2) The two fiber rope seat slings shall be of 5/8-inch diameter, reeved through the four seat holes so as to cross each other on the underside of the seat.
- (j)(3) Seat slings shall be of at least 3/8-inch wire rope when a workman is conducting a heat producing process such as gas or arc welding.
- (j)(4) The workman shall be protected by a safety life belt attached to a lifeline. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the worker in case of a fall.
- (j)(5) The tackle shall consist of correct size ball bearing or bushed blocks and properly spliced 5/8-inch diameter first-grade manila rope.
- (j)(6) The roof irons, hooks, or the object to which the tackle is anchored shall be securely installed. Tiebacks when used shall be installed at right angles to the face of the building and securely fastened to a chimney



Boatswain's Chair



#### Ladders

- Employers must comply with 29 CFR 1910.25 and .26 for portable ladders used by window washers.

Utah Administrative Code (R614- 6- 2 Window Cleaning) requires the following:

- Ladders shall not be used to clean windows whose top is more than 36 feet above the floor of adjoining ground or a flat roof or which are so placed or obstructed as to make the method unsafe. Built-up scaffolds are preferred over ladders.
- The use of ladders with hooks attached, to be hung on or over a parapet wall or other projection, are prohibited in window cleaning.

Electrical Safety: Keep a 10 feet distance from all overhead powerlines. Do not use metal ladders when working near energized powerlines.

#### PPE

- Appropriate personal protective equipment should be worn whenever the potential for a serious fall exists.
- Use of protective head gear : Evidence suggests that when hard hats are used in occupational settings a decrease in the occurrence and severity of head trauma has been observed.
- The employer shall provide training to each employee who is required by this section to use PPE. Each such employee shall be trained to know at least the following:
  - ✓ When PPE is necessary;
  - ✓ What PPE is necessary;
  - ✓ How to properly don, doff, adjust, and wear PPE;
  - ✓ The limitations of the PPE; and

- ✓ The proper care, maintenance, useful life

## ! Training

- Only employees who have been adequately trained and instructed shall be permitted to clean windows where the use of anchors, safety harnesses, swinging scaffolds, boatswains' chairs, tackle or other similar equipment is required. (Utah Administrative Code R614- 6- 2- Window Cleaning)
- Employees should receive training in the safe operation of all equipment prior to use.
- Manufacturers of suspension scaffolds should review design of controls for these units to determine if practical design changes could be made which would reduce the chance of incidents like this in the future. A standardization of control design for these scaffolds among all manufacturers could reduce the chance of employee error in the operation of the scaffold.
- Employees must be trained on the safe use of chemicals used for window cleaning according to the hazard communication standard 29 CFR 1910.1200.

## ! Chemical Safety:

- Window washers use a variety of cleaning agents during their work. Employers must comply with the hazard communication standard 29 CFR 1910.1200. The following elements are essential for the hazard communication program:

1. Written Program
2. MSDSs
3. Labels
4. Training

- A written hazard communication program must be readily available for the employees. Material Safety Data Sheets (MSDSs) are required for each chemical used by the employees. All containers must be labeled as to the chemical identity and follow labeling guidelines from 29 CFR 1910.1200(f)(1). All employees need to be trained on the hazards of the chemicals and the appropriate personal protective equipment such as gloves that might be required.

## ! Substance Abuse Program:

- Employers are encouraged to develop a substance abuse program for their employees. The program may include tests before employment, random and post accidents. A sample substance abuse program can be downloaded from [www.uosh.utah.gov](http://www.uosh.utah.gov) .

## ! Disciplinary Program:

- Employers should implement a progressive disciplinary program at their workplace. This ensures continuous safety for the employees. A disciplinary program can be downloaded from [www.uosh.utah.gov](http://www.uosh.utah.gov)



## Safety Harnesses and Suspension Trauma

Fall arrest systems save lives, but workers who remain suspended for lengthy periods of time in safety harnesses following a fall can develop a condition known as "orthostatic intolerance- the pooling of blood in the veins due to a force of gravity and lack of movement. OSHA has developed a safety and health bulletin that describes the signs and symptoms of the condition, outlines recommendations for preventing such occurrences, and discusses worker training and rescue.

### Description of Hazard

Orthostatic intolerance may be experienced by workers using fall arrest systems. Following a fall, a worker may remain suspended in a harness. The sustained immobility may lead to a state of unconsciousness. Depending on the length of time the suspended worker is unconscious/immobile and the level of venous pooling, the resulting orthostatic intolerance may lead to death. While not common, such fatalities often are referred to as "harness- induced pathology" or "suspension trauma."

Signs & symptoms that may be observed in an individual who is approaching orthostatic intolerance:

Faintness

Breathlessness

Sweating

Paleness

Hot Flashes

Increased Heart Rate

Nausea

Dizziness

Unusually Low Heart Rate

Unusually Low Blood Pressure

"Greying" or Loss of Vision



### Background

Orthostatic intolerance may be defined as "the development of symptoms such as light-headedness, palpitations, tremulousness, poor concentration, fatigue, nausea, dizziness, headache, sweating, weakness and occasionally fainting during upright standing". While in a sedentary position, blood can accumulate in the veins, which is commonly called "venous pooling," and cause orthostatic intolerance. Orthostatic intolerance also can occur when an individual moves suddenly after being sedentary for a long time. For example, a person may experience orthostatic intolerance when they stand up quickly after sitting still for a long time.

A well-known example of orthostatic intolerance is that of a soldier who faints while standing at attention for long period of time. The moment the soldier loses consciousness, he or she collapses into a horizontal position. With the legs, heart, and brain on the same level, blood is returned to the heart. Assuming no injuries are caused during the collapse, the individual will quickly regain consciousness and recovery is likely to be rapid.

Venous pooling typically occurs in the legs due to the force of gravity and a lack of movement. Some venous pooling occurs naturally when a person is standing. In the veins, blood normally is moved back to the heart through one-way valves using the normal muscular action associated with limb movement. If the

legs are immobile, then these "muscle pumps" do not operate effectively, and blood can accumulate. Since veins can expand, a large volume of blood may accumulate in the veins.

An accumulation of blood in the legs reduces the amount of blood in circulation. The body reacts to this reduction by speeding up the heart rate and in an attempt to maintain sufficient blood flow to the brain. If the blood supply is significantly reduced, this reaction will not be effective. The body will abruptly slow the heart rate and blood pressure will diminish in the arteries. During severe venous pooling, the reduction in quantity and/or quality (oxygen content) of blood flowing to the brain causes fainting. This reduction also can have an effect on other vital organs, such as the kidneys. The kidneys are very sensitive to blood oxygen, and renal failure can occur with excessive venous pooling. If these conditions continue, they potentially may be fatal.

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Unconscious/immobile workers suspended in their harness will not be able to move their legs and will not fall into a horizontal position, as they would if they fainted while standing. During the static upright position, venous pooling is likely to occur and cause orthostatic intolerance, especially if the suspended worker is left in place for some time. Venous pooling and orthostatic intolerance can be exacerbated by other circumstances related to the fall. For example, shock or the experience of the event that caused the fall, other injuries, the fit/ positioning of the harness, the environmental conditions, and the worker's psychological state all may increase the onset and severity of the pooling and orthostatic intolerance. Unless the worker is rescued promptly using established safe procedures, venous pooling and orthostatic intolerance could result in serious or fatal injury, as the brain, kidneys, and other organs are deprived of oxygen .

The amount of time spent in this position, with the legs below the heart, affects the manner in which the worker should be rescued. Moving the worker quickly into a horizontal position - a natural reaction - is likely to cause a large volume of deoxygenated blood to move to the heart, if the worker had been suspended for an extended period. The heart may be unable to cope with the abrupt increase in blood flow, causing cardiac arrest. Rescue procedures must take this into account. Recommended rescue procedures are outlined below in the Conclusions and Recommendations section.

### Conclusions and Recommendations

Prolonged suspension from fall arrest systems can cause orthostatic intolerance, which, in turn, can result in serious physical injury, or potentially, death. Research indicates that suspension in a fall arrest device can result in unconsciousness, followed by death, in less than 30 minutes. To reduce the risk associated with prolonged suspension in fall arrest systems, employers should implement plans to prevent prolonged suspension in fall protection devices. The plan should include procedures for: preventing prolonged suspension, identifying orthostatic intolerance signs and symptoms, and performing rescue and treatment as quickly as possible.

OSHA recommends the following general practices/considerations:

- . Rescue suspended workers as quickly as possible.
- . Be aware that suspended workers are at risk of orthostatic intolerance and suspension trauma.
- . Be aware of signs and symptoms of orthostatic intolerance.
- . Be aware that orthostatic intolerance is potentially life threatening. Suspended workers with head injuries or who are unconscious are particularly at risk.
- . Be aware of factors that can increase the risk of suspension trauma.
- . Be aware that some authorities advise against moving the rescued workers to a horizontal position too quickly.

## Training

OSHA requires employers to train workers to use fall arrest systems and other personal protective equipment correctly while performing their jobs, in accordance with standards 29 CFR 1910.132 (Personal Protective Equipment) 29 CFR 1915.159 (Personal Fall Arrest Systems) and 29 CFR 1926.503 (Training Requirements for Fall Protection).

Workers who wear fall arrest devices while working, and those who may perform rescue activities, should also be trained in:

- . How to ascertain whether their personal protective equipment is properly fitted and worn, so that it performs as intended;
- . How orthostatic intolerance/suspension trauma may occur;
- . The factors that may increase a worker's risk;
- . How to recognize the signs and symptoms identified in this bulletin; and
- . The appropriate rescue procedures and methods to diminish risk while suspended.

## Rescue Procedures

Under 29 CFR 1926.502 (d) (Fall Protection Systems Criteria and Practices), OSHA requires that employers provide for "prompt rescue of employees in the event of a fall or shall assure that employees are able to rescue themselves." This should include identifying rescue procedures that address the potential for orthostatic intolerance and suspension trauma. Rescue procedures also should address how the rescued worker will be handled to avoid any post- rescue injuries.

Rescue procedures should include the following contingency based actions:

- . If self- rescue is impossible, or if rescue cannot be performed promptly, the worker should be trained to "pump" his/her legs frequently to activate the muscles and reduce the risk of venous pooling. Footholds can be used to alleviate pressure, delay symptoms, and provide support for "muscle pumping."

- . Continuous monitoring of the suspended worker for signs and symptoms of orthostatic intolerance and suspension trauma.
- . Ensuring that a worker receives standard trauma resuscitation once rescued. Some authorities recommend that the patient be transported with the upper body raised.
- . If the worker is unconscious, keeping the worker's air passages open and obtain first aid.
- . Monitoring the worker after rescue, and ensuring that the worker is evaluated by a health-care professional. The worker should be hospitalized when appropriate. Possible delayed effects, such as kidney failure, which is not unusual in these cases, are difficult to assess on the scene.

## References

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